REMARKS/ARGUMENTS

Claims 1-6 and 8-10 are pending herein. Claim 8 has been amended as supported by Fig. 1 and in the specification at page 5, third paragraph to page 6, fourth page, for example. Applicants respectfully submit that no new matter has been added.

1. Claims 1-4 were rejected under §102(b) over DiSalvo. This rejection is respectfully traversed.

Claim 1 recites a method of growing a gallium nitride single crystal using a flux comprising at least sodium metal, the method comprising growing the gallium nitride single crystal in an atmosphere that includes a gas mixture comprising nitrogen gas under a total pressure of 300 atms to 1200 atms and at a temperature of 850° C to 1200°C. The atmosphere has a nitrogen partial pressure of 120 atms to 600 atms.

DiSalvo discloses a low temperature method of preparing gallium nitride single crystals.

Claim 1 is distinguishable from DiSalvo because DiSalvo fails to disclose the claimed total pressure of 300 to 1200 atms and the claimed nitrogen partial pressure of 120 to 600 atms. More specifically, DiSalvo simply discloses a total pressure of less than 120 atms (Col. 2, lines 4-11). In an attempt to overcome this deficiency, the PTO cites to the Background of the Invention Section of DiSalvo which discloses that gallium nitride single crystals have been prepared "under N_2 pressure of 8,000 to 17,000 atmospheres at temperatures ranging from 1,300° to 1,600° C" (Col. 1, lines 27-30). The cited section of DiSalvo, however, merely describes the so-called high temperature and pressure process for forming a gallium nitride single crystal in which

N_2 is forcibly introduced into Ga metal at extremely high temperatures and pressures. In contrast, claim 1 describes the Na-flux method using sodium metal as a flux for accelerating the action of Ga and N_2 to grow a GaN single crystal at a relatively low temperature of 850° C to 1200° C, and under a relatively low total pressure of 300 atms to 1200 atms and a nitrogen partial pressure of 120 atms to 600 atms. Thus, the disclosed pressure of 8,000 to 17,000 atms in the high temperature and pressure process disclosed in the background section of DiSalvo is inapplicable to the claimed method.

Further, since nitrogen gas is generated by decomposing sodium azide in a closed reaction zone in DiSalvo (Col. 1, lines 49-53) and the sodium azide is the sole source for generating nitrogen gas with no other gas generated or introduced (Col. 2, lines 4-10 and Examples 1-4), a total pressure disclosed in DiSalvo will be the same as the disclosed nitrogen partial pressure of less than 120 atms. Thus, DiSalvo fails to disclose a method of growing a gallium nitride single crystal in an atmosphere comprising nitrogen gas under a total pressure of 300 atms to 1200 atms and a nitrogen partial pressure of 120 atms to 600 atms, as claimed.

Based on the above, DiSalvo fails to disclose each and every element of claim 1. Accordingly, Applicants respectfully request that the Examiner reconsider and withdraw this rejection.

2. Claims 5, 6 and 8-10 were rejected under §103(a) over DiSalvo in view of Kelsey. With respect to claims 5 and 6, this rejection is respectfully traversed. With

respect to claims 8-10, to the extent that this rejection may be applied against the amended claims, it is respectfully traversed.

Claims 5 and 6 are distinguishable from the cited references because claims 5 and 6 depend from claim 1 and claim 1 is patentable for the reasons explained above.

Amended claim 8 recites a method for growing a gallium nitride single crystal using a crucible containing a flux comprising at least a sodium metal, with a moving part attached to a lower portion of the crucible and a seed crystal fixed over the crucible. The method comprises elevating the crucible by the moving part until the seed crystal contacts the flux, growing the gallium nitride single crystal in an atmosphere comprising a gas mixture comprising nitrogen gas under a total pressure of 300 atms to 2000 atms, and driving the crucible downward by the moving part to separate the seed crystal from the flux.

The disclosure of DiSalvo is discussed above. The PTO relies upon Kelsey for teaching the use of two metals to make gallium nitride (Office Action at page 4).

Amended claim 8 is distinguishable from the cited references for at least the following reasons.

First, amended claim 8 is distinguishable because neither reference discloses or suggests use of a moving part placed under the crucible to move the crucible upward and downward to contact and separate the seed crystal in the flux. In contrast, amended claim 1 now clearly recites use of a moving part attached to the lower portion of the crucible to elevate the crucible to contact the seed crystal and the flux to grow the gallium nitride single crystal, and to drive the crucible downward to separate the

seed crystal from the flux. Thus, the claimed method of growing a gallium nitride single crystal using a crucible containing flux is distinct from the cited references.

Second, DiSalvo fails to disclose or suggest growing a gallium nitride single crystal under a total pressure of 300 atms to 2000 atms for the same reasons explained above with respect to claim 1. Kelsey fails to overcome the deficiencies of DiSalvo.

Based on the above, the cited references fail to teach or suggest each and every element of amended claim 8 and claim 1 is distinguishable for the reasons recited previously. Accordingly, Applicants respectfully request that the Examiner reconsider and withdraw this rejection.

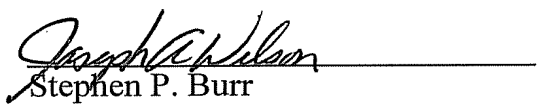
For at least the foregoing reasons, Applicants respectfully submit that all pending claims herein define patentable subject matter over the art of record.

If the Examiner believes that contact with Applicants' attorney would be advantageous toward the disposition of this case, the Examiner is herein requested to call Applicants' attorney at the phone number noted below.

The Commissioner is hereby authorized to charge any additional fees associated with this communication or credit any overpayment to Deposit Account No. 50-1446.

Respectfully submitted,

December 17, 2009
Date



Stephen P. Burr
Reg. No. 32,970

Joseph A. Wilson
Reg. No. 53,780

SPB/JAW/cmb
BURR & BROWN
P.O. Box 7068
Syracuse, NY 13261-7068

Customer No.: 025191
Telephone: (315) 233-8300
Facsimile: (315) 233-8320